

MIT-SCAN2-BT

Measuring system for the non-destructive and accurate measurement of dowel positions in concrete pavements in compliance with ASTM E3013/E3013M-15

PRECISION

MADE IN
GERMANY





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Measuring system for the non-destructive and accurate measurement of dowel positions in concrete pavements

Joints in concrete pavements of highways, airport runways and container areas are exposed to stresses and strains due to traffic and temperature variation. Steel dowel bars and tie bars are built into joints, to support the transfer of loads across the joints and to maintain the elevation of adjacent slabs at the joints. The type and the number of dowels and tie bars as well as their accurate positions and tolerable displacements are accurately determined, to ensure the long-term performance of the joints.

Accurate and effective

Since 2001, a new standard for the non-destructive measurement of dowel bars has been achieved with the measurement system MIT-SCAN-2. Also international partners rely on the accuracy of the system. Several States in the USA and Provinces in Canada specify the use of the measurement system for the operation of dowel bar inserters.

The measuring system.

MIT-SCAN2-BT consists of a compact rail-guided measuring device, an easily assembled GRP* rail system and a Pocket PC (*robust glass fiber reinforced plastic).

Software for controlling and data analysis

The Pocket PC communicates with the measuring device via a wireless connection. The software MagnoNorm, that runs on the Pocket PC, controls the action of the device. The measurement data can be automatically recorded, reviewed and analyzed on-site. The software MagnoProof has been created for a more detailed data evaluation and the creation of reports on a desktop PC.

EASY HANDLING, FAST AND ACCURATE DATA ANALYSIS

Positioning of the device

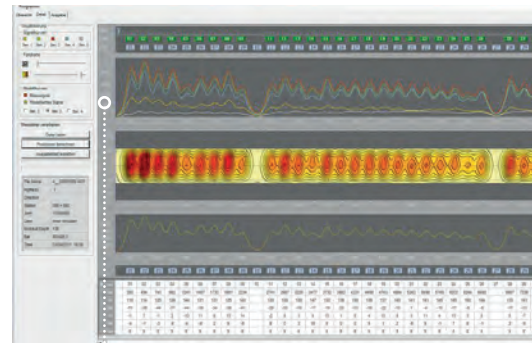
Performing a measurement is very simple. The mobile rail system is placed along the joint. Afterwards, the measuring device is set on the rail.

Measuring

The measuring device is pulled slowly over the rails. The control of the measurement is done by a Pocket PC, that communicates wirelessly with the measuring device. During the measurement the covered distance and the recorded data are shown on the display of the Pocket PC.

Analysis

Once the measuring data is collected, the software application MagnoNorm calculates the position of the dowel bars and error parameters - side shift, horizontal and vertical misalignment and depth error. Reports conforming to standards and a three-dimensional presentation of dowel bar positions can be created and printed with the software MagnoProof. This is a post processing software application, that allows the rapid analysis of large quantities of measurements. MagnoProof provides additional tools for the analysis of strongly deviating dowel bar positions and for the handling of complicated measuring situations.



Effective.

Immediate calculation of dowel bar positions even during a test run

Easy.

Software with a user-friendly handling

Precise.

Accurate determination of dowel embedment depth, tilt and shift misalignment

ADVANTAGES AT A GLANCE

- Specialized system for the measurement of dowel bar and tie bar positions (including bars in dowel baskets)
- Easy handling, assembly and transport
- Accurate and fast non-destructive measurement of dowel bar positions
- Easy control of the measurement and on-site analysis with a Pocket PC
- High precision: Depth and misalignments of bars can be determined with a tolerance of ± 4 mm, side shift with a tolerance of ± 8 mm (peak to peak)
- Efficient inspection of long route sections (500-600 joints of 16 m length per day)
- Measurements can be performed as soon as the concrete is walkable
- Comprehensive analysis and visualization of data and measuring results with the desktop software

MEASURING METHOD

MIT-SCAN2-BT operates using the principles of the eddy current method (pulse induction method). By means of a sensor field, a high sampling rate and an accurate distance measurement in the moving direction of the measuring device, magnetic answering fields are recorded.

TECHNICAL DATA MIT-SCAN2-BT

Description			Delivered components
Measuring device	Size	116 x 65.5 x 9.5 cm (45.7 x 25.8 x 3.7 in)	<ul style="list-style-type: none"> - Measuring device - Battery (built in) - Charger - Operating manual - Transport box
	Weight	16.5 kg / (36.4 lbs)	
	Battery	Lead-gel: 12 V / 7.2 Ah	
	Operating time	8 hours	
	Charging time	4 hours	
Rail system	Length of rail segments	1.0 m (3.3 ft) standard	<ul style="list-style-type: none"> - Rail segments of GRP (robust glas fiber reinforced plastic), 1.0 m (3.3 ft) - Crossties with wheels - End segments 0.6 m (1.9 ft) - Knurled screws - Transport box
	Rail width	1.18 m (3.9 ft)	
	Total length	10 m (32.8 ft) standard length, can be extended	
Pocket PC	Size	159 x 78 x 32 mm (6.3 x 3.1 x 1.3 in)	<ul style="list-style-type: none"> - CASIO IT800 - Memory card - Cradle - Power supply - USB cable
	Operating system	Windows Mobile 6.5	
	Color display	640 x 480 px / 3.7 in	
	Processor	Marvell PXA320	
	RAM	128 MB	
	Weight	350 g	
Software	MagnoNorm	Installed on Pocket PC	<ul style="list-style-type: none"> - Software on data medium - Operating manuals
	MagnoProof	Installed on Desktop PC	
Scope of validity			
Depth	110 mm ... 190 mm (4.3 in ... 7.5 in), greater depth on request		
Side shift	max. 80 mm (3.2 in)		
Horizontal misalignment	max. 40 mm (1.6 in)		
Vertical misalignment	max. 40 mm (1.6 in)		
Tolerances			
Repeatability	2 mm (0.1 in)		
Path measurement	$\pm (3 \text{ mm} + 0.3 \% \text{ of the distance}) / \pm (0.15 \text{ in} + 0.3 \% \text{ of the distance})$		
Depth	$\pm 4 \text{ mm} (0.2 \text{ in})$		
Side shift	$\pm 8 \text{ mm} (0.3 \text{ in})$		
Horizontal misalignment	$\pm 4 \text{ mm} (0.2 \text{ in})$		
Vertical misalignment	$\pm 4 \text{ mm} (0.2 \text{ in})$		
Environment			
Operating temperature	-5° C ... 50° C (23°F ... 122°F)		
Storage temperature	-10° C ... 50° C (14°F ... 122°F)		
Concrete condition	Operates on wet surfaces and on walkable green concrete		

MIT Mess- und Prüftechnik GmbH

Gostritzer Straße 63 · 01217 Dresden
Germany

Phone +49 (0) 351 871 81 25

Fax +49 (0) 351 871 81 27

info@mit-dresden.de



www.mit-dresden.de